Trend Study 30-40-03

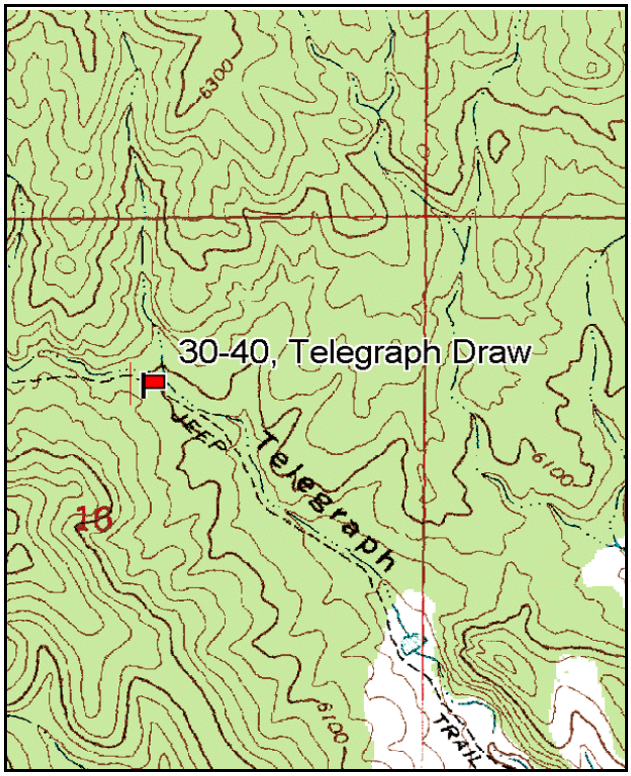
Study site name: Telegraph Draw . Vegetation type: Chained, seeded P-J .

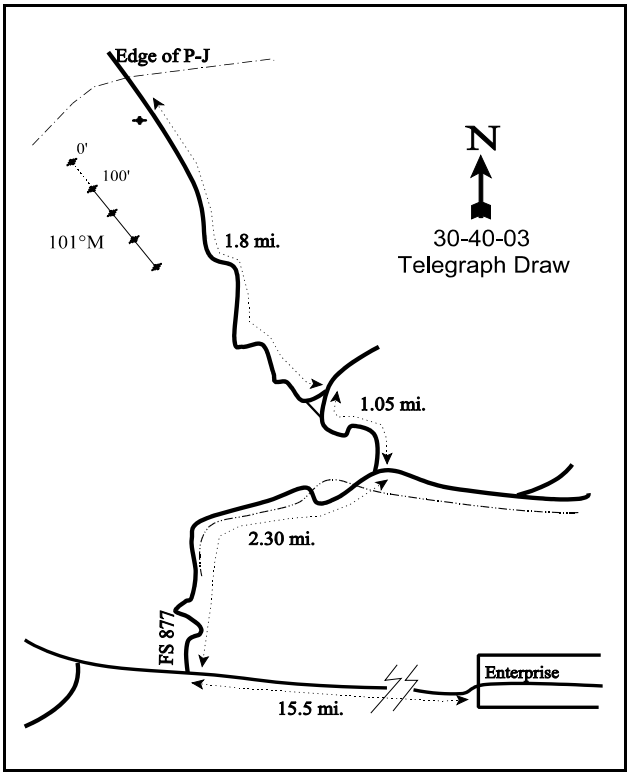
Compass bearing: frequency baseline 101 degrees magnetic.

Frequency belt placement: line 1 (14 & 81ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). No rebar.

LOCATION DESCRIPTION

From Center and Main in Enterprise, go west on the Shoal Creek road for 15.5 miles then turn right (north). Clover Valley road is 0.1 miles too far. Stay on the main road heading north for approximately 2.3 miles. At this point, there will be a fork in the road. Go to the left (north) on F.S. road 1014 for approximately 1.05 miles to a triangle of roads at the top of the ridge. Stay to the left on the road that goes down into the draw for 1.8 miles, at which point the road enters pinyon-juniper. Just as you come to the pinyon-juniper, stop at the witness post on the left side of the road. The 0-foot baseline stake is located 49 paces from the witness post at 139 degrees magnetic. The study is marked by green steel "T" fence posts approximately 12 to 18 inches in height. The 0-foot stake is marked by browse tag #287.





Map Name: Mount Escalante

Diagrammatic Sketch

Township 36S , Range 19W , Section 16

GPS: NAD 27, UTM 12S 4171910 N, 236961 E

DISCUSSION

Telegraph Draw - Trend Study No. 30-40

This trend study is located on winter range in Telegraph Draw. The area has been chained and seeded, although the long range success of the seeded species has been minimal and pinyon and juniper trees are still abundant. The site has an elevation of approximately 6,080 feet and a 10% slope and southeast aspect. Vegetative cover on the study site is considerably improved over the surrounding pinyon-juniper woodland, but is still rather sparse and variably dispersed. The overall vegetative appearance is Wyoming big sagebrush interspersed with young pinyon and juniper trees. Deer use is primarily during the winter, however fresh pellet groups were observed during the summer of 1992. In addition, wild horses and stud piles were observed nearby, and fresh unshod pony tracks were encountered on the study site in 1992. This study is located in an area of the USFS Terryshoal Creek allotment that receives no use by livestock and is set aside for wild horses and burros. Use by either deer or horses appears light. Pellet group data from the site in 1998 estimated only 14 deer days use/acre (35 ddu/ha). Use by wild horses was estimated at 14 days use/acre (36 hdu/ha). Several wild horses were also seen near the site during the 1998 reading on May 29th. Pellet group data from the 2003 reading estimated only 4 deer days use/acre (10 ddu/ha) and 9 horse days use/acre (23 hdu/ha).

Soil is relatively deep and rocky with an effective rooting depth of 17 inches. Soil parent material is granite and rocks are common on the surface. Texture is a sandy clay which is moderately acidic (pH 5.6). The soil is sandy on the surface with a compacted clay layer encountered at a depth of 4 inches. This granitic soil is very low in phosphorus with a value of only 3.8 ppm. Values less than 10 ppm may limit normal plant growth and development. This may be the reason for the poor herbaceous growth on this site while trees are quickly returning to dominance. Some surface erosion has taken place, whereas active erosion has been greatly reduced from what occurs on untreated areas. Pinyon and juniper litter from downed and broken up trees is dispersed throughout the site. The association of litter and with the increased vegetation has tended to stabilize the site.

The key browse is Wyoming big sagebrush which has hybridized with black sagebrush in some areas. All sagebrush has been classified as Wyoming big sagebrush. Population density was estimated at 6,166 plants/acre in 1982 when the site was established. The stand is dynamic with abundant seedling and young recruitment causing major fluctuations in density over the years. Data from 2003 estimate a population of 6,740 plants/acre. Utilization has been mostly light during all readings, vigor good on most plants, and percent decadence low.

Other preferred browse include a small population of antelope bitterbrush. Presumably, the bitterbrush were seeded after the chaining. These plants have shown moderate to heavy use, good vigor, and low decadence since 1982. The average mature plant measures just over 3 feet in height with a crown diameter of more than 4 feet. Young recruitment has steadily improved and the population has steadily increased in density since study site establishment.

Increaser shrubs, including two species of rabbitbrush and broom snakeweed, appeared to be increasing on the site. However, drought conditions have caused major declines in their respective population densities. Pinyon and juniper trees have increased in density and stature. Point-quarter data from 1998 estimated 160 singleleaf pinyon and 56 juniper trees/acre. Average basal diameter was 2.5 inches for pinyon and 3.6 inches for juniper. Point-quarter data from 2003 is similar but shrub density strip data, which more effectively samples young and seedling trees, shows a 36% increase in juniper density (140 to 220 trees/acre) and a 5% increase in density of pinyon (380 to 400 trees/acre). About 40% of the trees were in the 8 to 12 foot height class. Average cover for juniper has doubled since 1998 (2% to 4%) and total line-intercept cover was estimated at 7% for juniper and 8% for pinyon in 2003.

The herbaceous understory is poor. Grasses are fairly diverse, yet they only produced 5% cover in 1998 and less than 1% in 2003. Cheatgrass provided 52% of the grass cover in 1998 and 39% in 2003. The only fairly common perennial grasses include crested wheatgrass, Indian ricegrass, mutton bluegrass, and bottlebrush squirreltail. Forbs outnumber grasses in abundance and species diversity. The principal species are desert phlox and rock goldenrod. Hooker balsamroot, bastard toadflax, and sulfur eriogonum are also fairly abundant. No seeded forbs were encountered or observed.

1982 APPARENT TREND ASSESSMENT

Overall, trend appears to be improving. Considerable soil surface is exposed and potentially erodible, but much less so than in the surrounding pinyon-juniper woodland. However, further stabilization is likely to be slow because of the amount of rock and pavement and the relatively poor grass cover. Vegetational trend also appears to be improving, particularly with respect to the key species. Actual or potential deficiencies include a sparse grass density, lack of seeded forbs, scarcity of more preferred shrubs, and the abundance of young pinyon and juniper trees.

1992 TREND ASSESSMENT

The soil trend appears to have improved since 1982. Basal vegetative cover has doubled since the last reading, although bare ground has decreased by 63% (27% to 10%). However, combined rock and pavement cover have also doubled, indicating past surface erosion. Litter has remained stable. Total protective ground cover has increased from 73% to 90%. The trend for browse is also up. The key browse species, Wyoming big sagebrush, has nearly doubled in density and have improved vigor. The herbaceous trend is stable. Grasses have increased slightly in quadrat frequency and forbs have remained stable. Forbs are abundant and diverse but consist of poor forage species. No seeded forbs were encountered.

TREND ASSESSMENT
soil - up (5)
browse - up (5)
herbaceous understory - stable (3)

1998 TREND ASSESSMENT

Trend for soil is down slightly, due to an increase in percent bare ground from 10% to 20%, and a decline in litter cover from 58% to 51%. Trend for browse stable. Wyoming big sagebrush shows a major decline in density from 11,830 plants/acre to 4,560. Whereas, due to the lack of dead plants, it appears that the change is due mostly to the much larger sample used in 1998. Utilization, vigor, and percent decadence are similar to 1992 levels. Reproduction is also excellent with abundant seedlings and young. Bitterbrush is increasing. It has moderate use, good vigor, and low decadence. Trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses and forbs has remained similar to 1992 levels. Composition is poor with cheatgrass providing 52% of the grass cover, and rock goldenrod and desert phlox providing 51% of the forb cover.

TREND ASSESSMENT
soil - down slightly (2)
browse - stable (3)
herbaceous understory - stable, but poor (3)

2003 TREND ASSESSMENT

Trend for soil is stable with similar ground cover characteristics compared to 1998 estimates. There is little erosion occurring and the soil erosion condition class was determined to be stable in 2003. Trend for the key browse species, Wyoming big sagebrush and antelope bitterbrush is up. Both species have increased in density, 36% for sagebrush and 28% for bitterbrush. Sagebrush is mostly unutilized, in good vigor, and percent decadence is low at 15%. Young recruitment remains excellent indicating a dynamic and expanding population. Bitterbrush shows some moderate and heavy use yet good vigor and excellent young recruitment. Drought conditions have caused an increase in decadence from 6% of the population to 23%, but this is still relatively low. The only down side to the browse trend is the continued increase in density and cover of pinyon and juniper trees which are slowly regaining their dominance of this old chaining. Current line-intercept canopy cover is estimated at 7% for juniper and 8% for pinyon. Trend for the herbaceous understory is down. Sum of nested frequency for both perennial grasses and forbs has declined. Most perennial grasses have declined significantly in nested frequency and average cover has declined 77%. The only positive change in the grass composition is the significant decline in nested frequency of the annual, cheatgrass. The forb composition is diverse whereas only toadflax, rock goldenrod, and desert phlox are fairly common. Twenty four species of forbs were sampled in 1998 and only 18 in 2003.

TREND ASSESSMENT
soil - stable (3)
browse - up (5)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Management unit 30 , Study no: 40

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
G	Agropyron cristatum	12	12	17	.11	.25
G	Bromus tectorum (a)	-	$_{b}$163	$_{a}$82	2.52	.35
G	Elymus junceus	9	-	-	-	-
G	Hilaria jamesii	-	4	-	.03	-
G	Koeleria cristata	3	-	-	-	-
G	Oryzopsis hymenoides	$_{a}$5	$_{b}$50	$_{a}$16	1.05	.06
G	Poa fendleriana	$_{a}$2	$_{b}$30	$_{a}$6	.47	.04
G	Poa secunda	-	2	-	.00	-
G	Sitanion hystrix	$_{c}$65	$_{b}$43	$_{a}$5	.57	.02
G	Stipa comata	3	-	-	-	-
G	Stipa coronata depauperata	$_{b}$45	$_{a}$5	$_{a}$-	.06	-
G	Stipa lettermani	$_{a}$-	$_{a}$-	$_{b}$24	-	.16
Total for Annual Grasses		0	163	82	2.52	0.35
Total for Perennial Grasses		144	146	68	2.30	0.54
Total for Grasses		144	309	150	4.83	0.89

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
F	Alyssum alyssoides (a)	-	1	-	.00	-
F	Allium spp.	-	1	-	.00	-
F	Antennaria rosea	-	-	2	-	.00
F	Astragalus spp.	1	2	-	.03	-
F	Balsamorhiza hookeri	a1	b23	b18	.57	.72
F	Chaenactis douglasii	a5	b20	a-	.09	-
F	Comandra pallida	a9	a30	b55	.24	.45
F	Collinsia parviflora (a)	-	6	22	.02	.04
F	Crepis acuminata	2	-	1	-	.09
F	Dalea searlsiae	b12	a-	a-	-	-
F	Descurainia pinnata (a)	-	-	2	-	.00
F	Eriogonum cernuum (a)	-	5	-	.06	-
F	Erigeron spp.	-	3	-	.03	-
F	Eriogonum spp.	-	7	-	.16	-
F	Eriogonum racemosum	8	9	-	.10	-
F	Eriogonum shockleyi	1	-	5	-	.15
F	Eriogonum umbellatum	a34	b39	a19	.29	.16
F	Gilia spp. (a)	-	6	-	.04	-
F	Hymenopappus filifolius	1	-	-	-	-
F	Ipomopsis aggregata	1	-	-	-	-
F	Lappula occidentalis (a)	-	12	14	.05	.03
F	Lomatium spp.	a-	a4	b13	.04	.03
F	Lotus utahensis	b8	ab3	a-	.03	-
F	Lupinus argenteus	b17	ab4	a2	.06	.00
F	Machaeranthera canescens	5	-	-	-	-
F	Microsteris gracilis (a)	-	b80	a6	.20	.01
F	Orobanche fasciculata	-	-	1	-	.00
F	Penstemon caespitosus	b45	a-	a-	-	-
F	Penstemon spp.	8	7	-	.07	-
F	Petradoria pumila	55	52	37	1.41	.74
F	Phlox austromontana	ab63	b76	a34	1.62	.38
F	Phlox longifolia	14	6	7	.03	.04
F	Polygonum douglasii (a)	-	-	1	-	.00
F	Senecio multilobatus	9	-	-	-	-
F	Sphaeralcea grossulariaefolia	1	-	-	-	-
F	Streptanthus cordatus	a-	b30	a-	.64	-

Type	Species	Nested Frequency			Average Cover %	
		'92	'98	'03	'98	'03
F	Trifolium spp.	$_{b}$22	$_{a}$12	$_{a}$13	.06	.05
Total for Annual Forbs		0	110	45	0.38	0.09
Total for Perennial Forbs		322	328	207	5.52	2.87
Total for Forbs		322	438	252	5.91	2.97

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 30 , Study no: 40

Type	Species	Strip Frequency		Average Cover %	
		'98	'03	'98	'03
B	Artemisia tridentata wyomingensis	80	82	14.61	21.35
B	Ceanothus greggii	0	1	-	.03
B	Chrysothamnus depressus	33	8	.44	.21
B	Chrysothamnus viscidiflorus	29	12	1.47	.57
B	Gutierrezia sarothrae	20	17	.17	.28
B	Juniperus osteosperma	7	10	2.04	4.28
B	Opuntia spp.	0	1	-	-
B	Pinus monophylla	18	15	5.69	4.85
B	Polygala subspinosa subspinosa	0	6	-	.01
B	Purshia tridentata	26	28	3.97	6.86
Total for Browse		213	180	28.41	38.46

CANOPY COVER, LINE INTERCEPT --
Management unit 30 , Study no: 40

Species	Percent Cover	
	'98	'03
Artemisia tridentata wyomingensis	-	16.96
Ceanothus greggii	-	.03
Chrysothamnus depressus	-	.11
Chrysothamnus viscidiflorus	-	.35
Gutierrezia sarothrae	-	.10
Juniperus osteosperma	1.00	7.05
Pinus monophylla	-	7.76
Purshia tridentata	-	7.18

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 30 , Study no: 40

Species	Average leader growth (in) '03
Artemisia tridentata wyomingensis	1.0
Purshia tridentata	0.6

POINT-QUARTER TREE DATA --
Management unit 30 , Study no: 40

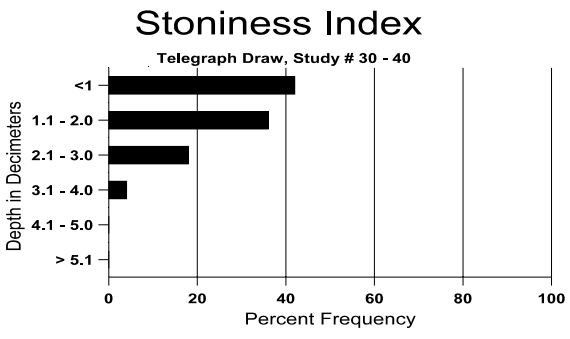
Species	Trees per Acre '98	Trees per Acre '03	Average diameter (in) '98	Average diameter (in) '03
Juniperus osteosperma	56	59	3.6	6.4
Pinus monophylla	161	122	2.5	3.3

BASIC COVER --
Management unit 30 , Study no: 40

Cover Type	Average Cover % '92	'98	'03
Vegetation	4.25	39.52	39.01
Rock	6.00	10.70	8.96
Pavement	22.25	13.13	8.37
Litter	58.00	51.14	44.97
Cryptogams	0	.17	.07
Bare Ground	9.50	20.32	17.92

SOIL ANALYSIS DATA --
Management unit 30, Study no: 40, Study Name: Telegraph Draw

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	ds/m
16.9	61.2 (14.7)	5.6	46.0	17.4	36.6	2.4	3.8	310.4	0.4



PELLET GROUP DATA --
Management unit 30 , Study no: 40

Type	Quadrat Frequency	
	'98	'03
Rabbit	8	2
Horse	3	4
Deer	9	3

Days use per acre (ha)	
'98	'03
-	-
16 (40)	9 (23)
21 (52)	4 (10)

BROWSE CHARACTERISTICS --
Management unit 30 , Study no: 40

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata wyomingensis											
82	**6166**	466	3300	2866	-	-	6	2	0	0	16/18
92	**11833**	833	4700	6533	600	-	17	2	5	5	13/15
98	**4560**	1260	1120	3280	160	20	29	1	4	1	19/29
03	**6740**	40	1200	4560	980	180	0	0	15	5	20/27
Ceanothus greggii											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**20**	-	-	20	-	-	0	100	-	0	5/12
Chrysothamnus depressus											
82	**0**	-	-	-	-	-	0	0	0	0	-/-
92	**0**	-	-	-	-	-	0	0	0	0	-/-
98	**2300**	220	640	1600	60	-	0	0	3	3	4/6
03	**280**	20	20	240	20	-	7	14	7	0	4/6
Chrysothamnus nauseosus											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	5/8
Chrysothamnus viscidiflorus											
82	**0**	-	-	-	-	-	0	0	0	0	-/-
92	**133**	-	100	-	33	-	0	0	25	25	-/-
98	**1360**	-	260	1040	60	-	0	0	4	1	11/16
03	**520**	-	80	340	100	20	0	4	19	12	13/18

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Gutierrezia sarothrae											
82	**0**	-	-	-	-	-	0	0	0	0	-/-
92	**66**	-	33	33	-	-	0	0	0	0	6/4
98	**1420**	580	300	1100	20	20	0	0	1	1	6/10
03	**720**	-	100	620	-	120	0	0	0	0	5/6
Juniperus osteosperma											
82	**166**	-	-	166	-	-	0	0	-	0	39/26
92	**99**	-	66	33	-	-	0	0	-	0	81/54
98	**140**	-	40	100	-	20	0	0	-	0	-/-
03	**220**	-	80	140	-	-	0	0	-	0	-/-
Opuntia spp.											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**20**	-	-	20	-	-	0	100	-	0	7/16
Pinus monophylla											
82	**166**	-	-	166	-	-	0	0	0	0	32/31
92	**332**	33	266	33	33	-	10	0	10	10	110/74
98	**380**	60	240	140	-	20	0	0	0	0	-/-
03	**400**	40	260	120	20	20	0	0	5	5	-/-
Polygala subspinosa subspinosa											
82	**66**	-	-	66	-	-	0	0	-	0	5/8
92	**266**	-	33	233	-	-	0	0	-	0	3/4
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**140**	-	20	120	-	-	0	0	-	0	3/3
Purshia tridentata											
82	**200**	-	-	200	-	-	50	17	0	0	26/31
92	**332**	66	33	233	66	-	10	20	20	0	34/43
98	**620**	240	140	440	40	20	48	16	6	0	34/49
03	**860**	20	220	440	200	-	12	5	23	5	38/53
Ribes spp.											
82	**0**	-	-	-	-	-	0	0	-	0	-/-
92	**0**	-	-	-	-	-	0	0	-	0	-/-
98	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	40/65